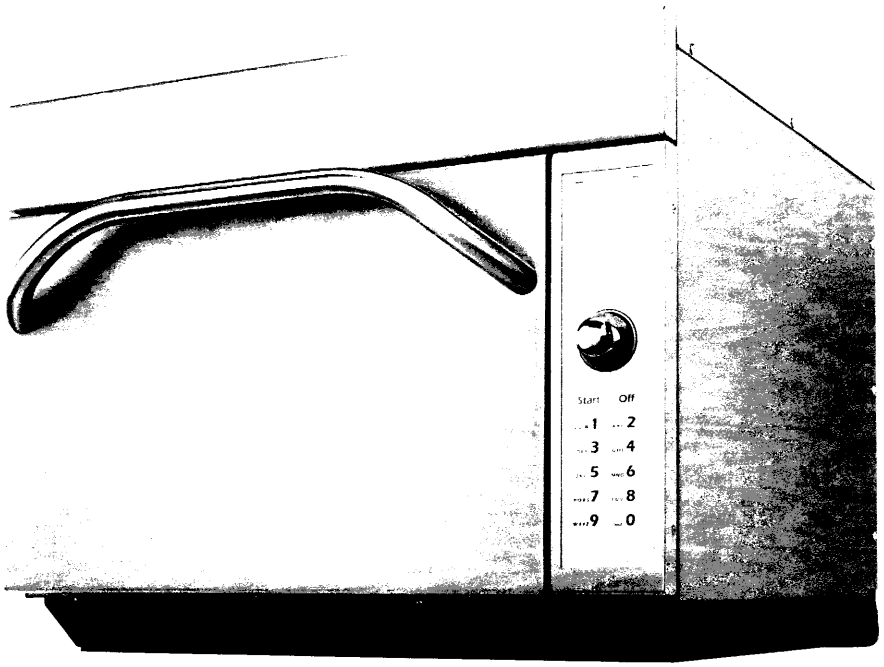
Training Manual

High Speed Combination Oven



AXP 20

P1333601M

60 Hz
August, 2007

Microwave Specialities Inc.

Amana®

8671 CHERRY LANE
LAUREL, MARYLAND 20707
1-800-332-2448 (301) 953-8808

Important Items

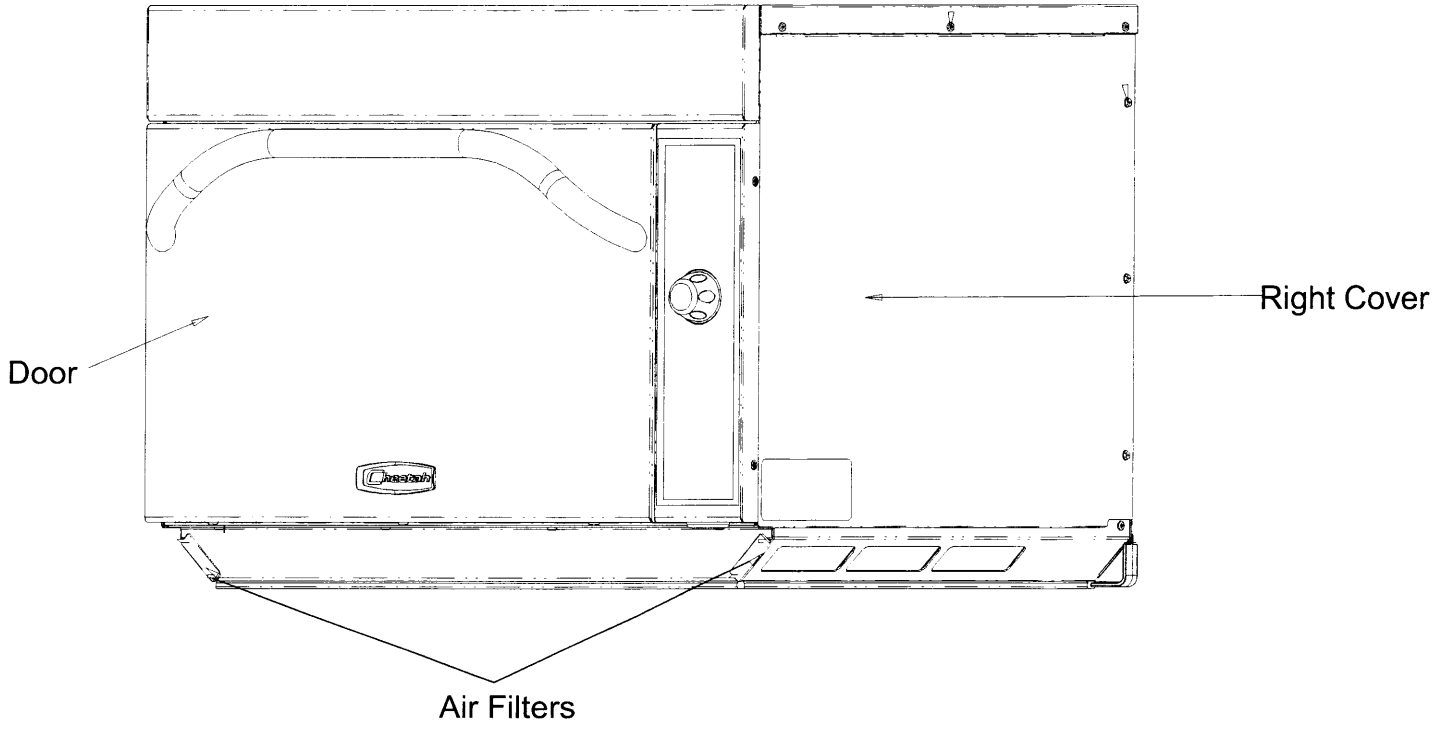
•	**It is okay to use metal in this oven (maximum one inch lip on sides).**
•	**This oven must be cleaned daily.**
•	**To clean the oven cavity, wipe off excessive residue with damp cloth. DO NOT use metal utensils.**
•	**The oven filters should be removed and rinsed off regularly to ensure good air flow and prevent the oven from overheating.**
•	**If the oven malfunctions, unplug oven for 10 seconds and reconnect.**
•	**Oven fan will run in OFF condition until cavity<200F to cool down components.**
•	**The oven may not be preprogrammed when shipped to a customer.**
•	**CLn FLtr will appear in the display with one of the following options listed.** **- 7 days (factory setting)** **- 30 days** **- 90 days**
•	**To check oven temperature, see Checking Oven Temperature page. Service Test RTD.**
•	**The oven temperature can be set to 200F - 520F.**

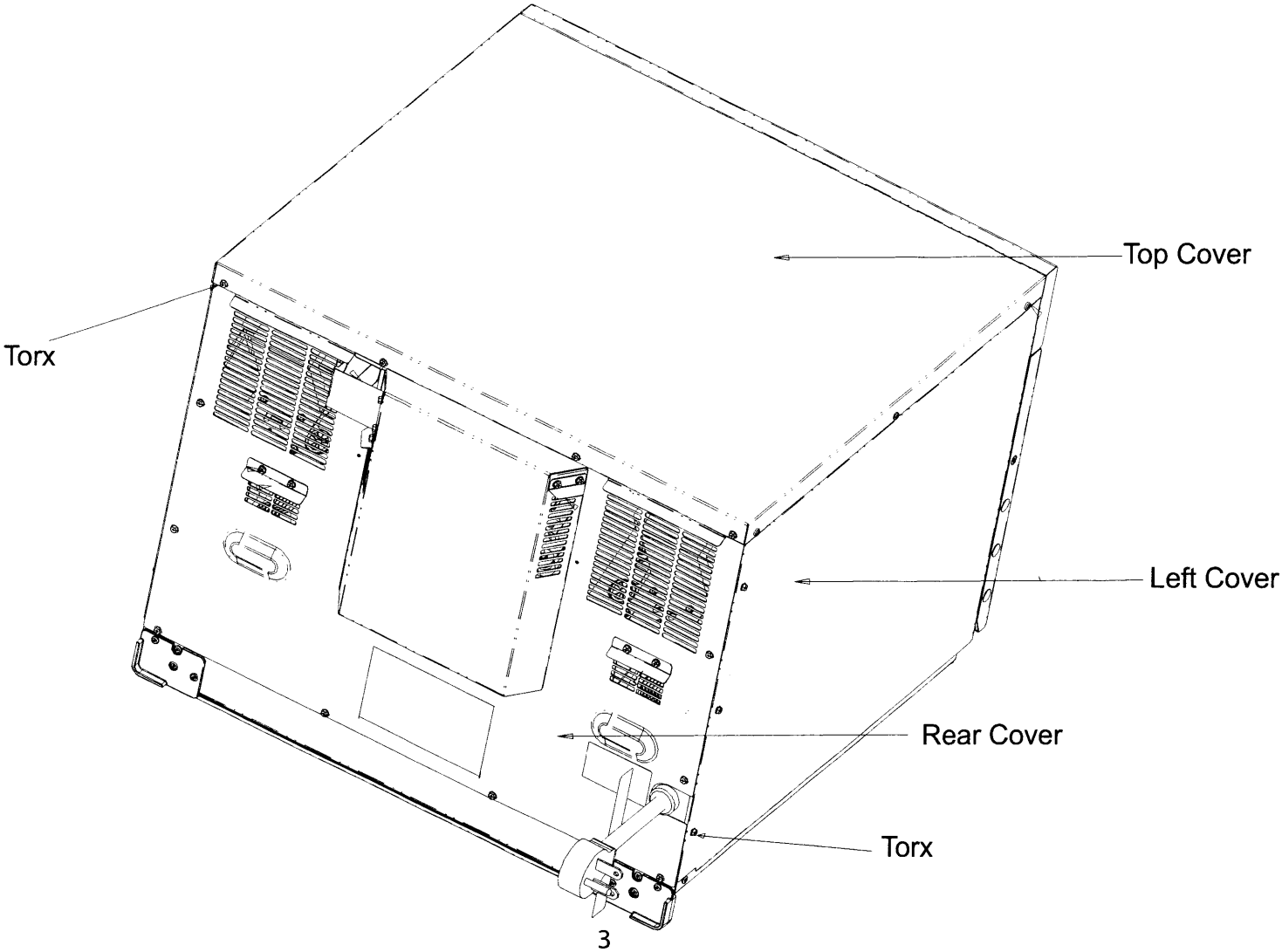
AXP20

208/230 V, 60 Hz

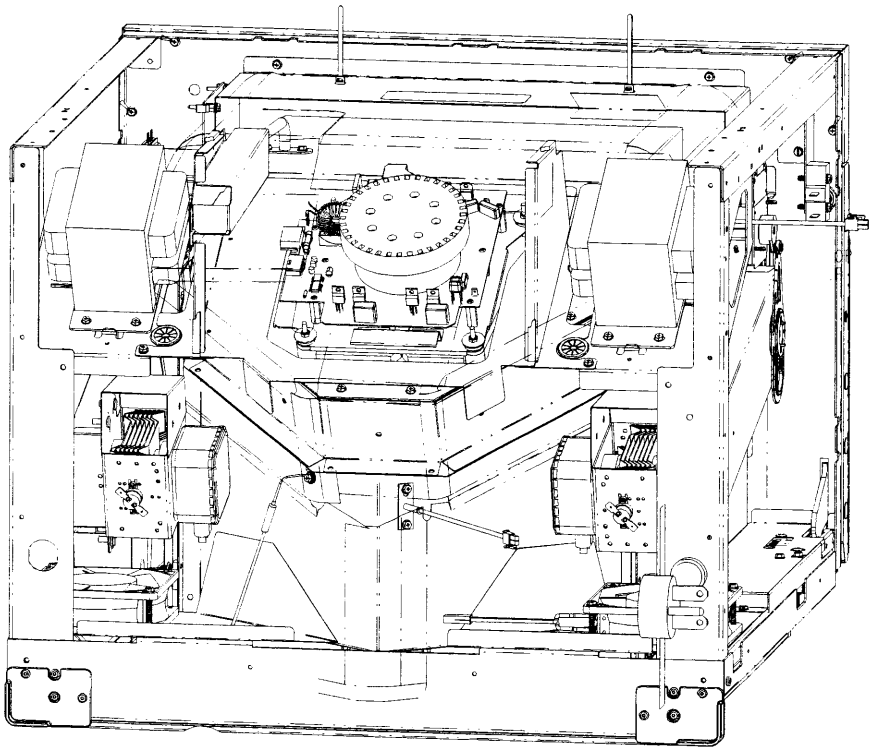
Models	AXP20
Power Source	
Voltage AC	208/230 VAC
Amperage (Single Unit)	30 A
Frequency	60 Hz
Single Phase, 3 wire grounded	X
Receptacle	6-30R
Plug	6-30P
Power Output – Microwave	
Nominal microwave energy (IEC705)	2000 Watts
Operating Frequency	2450 MHz
Power Consumption	
Microwave only	4200 Watts
Convection fan	425 Watts / 6200 RPM
Radiant heater	3000 Watts
Convection heater	2000 Watts
Combination	5300 Watts
Dimensions	
Cabinet (in / cm)	25" 63.5 cm
Width	20 .25" 51 cm
Height	25.625" 65 cm
Depth	
Oven Interior (in / cm)	16" 41 cm
Width	7.75" 20 cm
Height	15" 38 cm
Depth (includes cord bracket on back)	
Weight (lbs. / kg)	
Uncrated	150 lbs. 68 kg

AXP 20
- Panels Installed

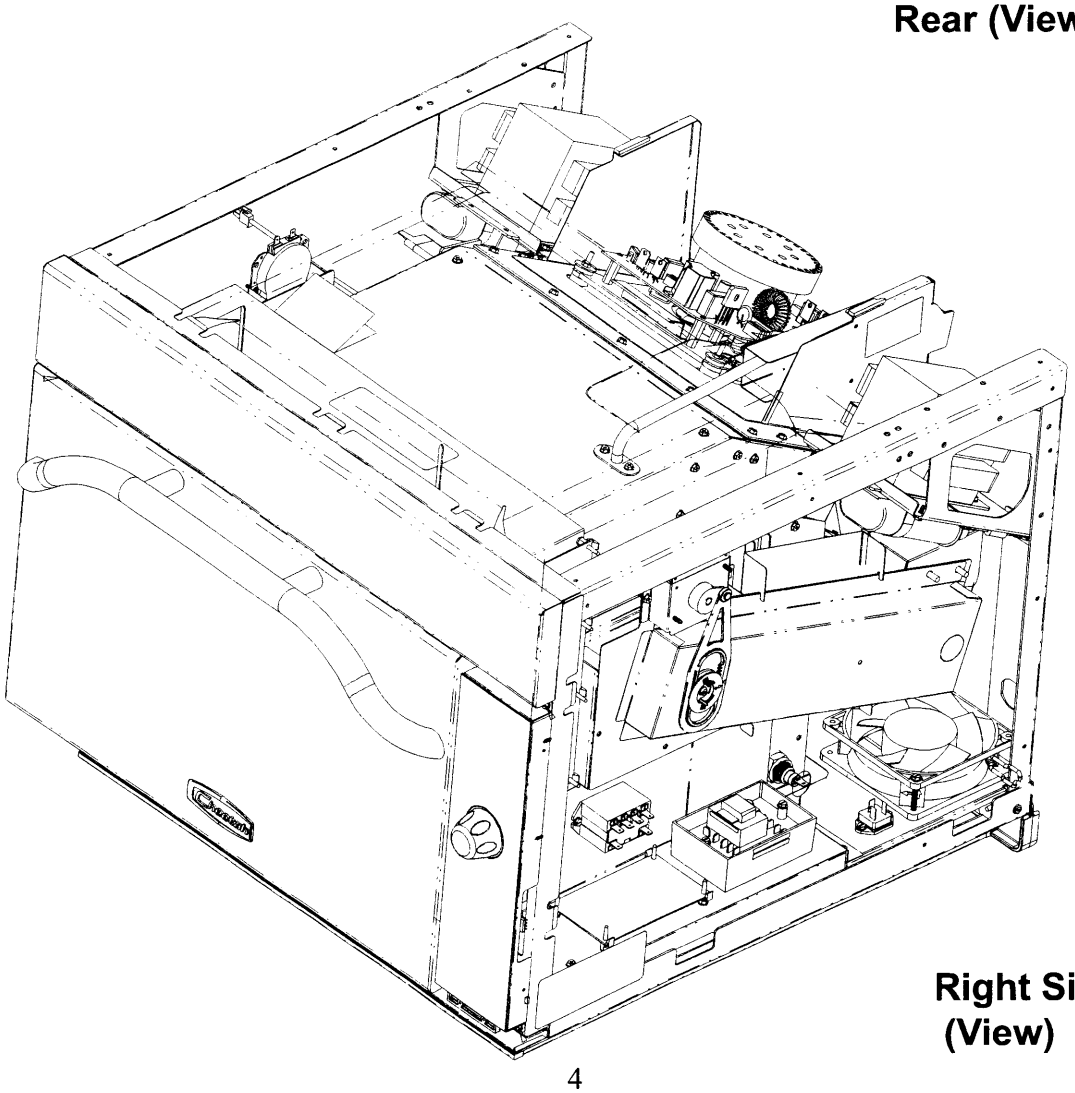




AXP 20
- Panels Removed

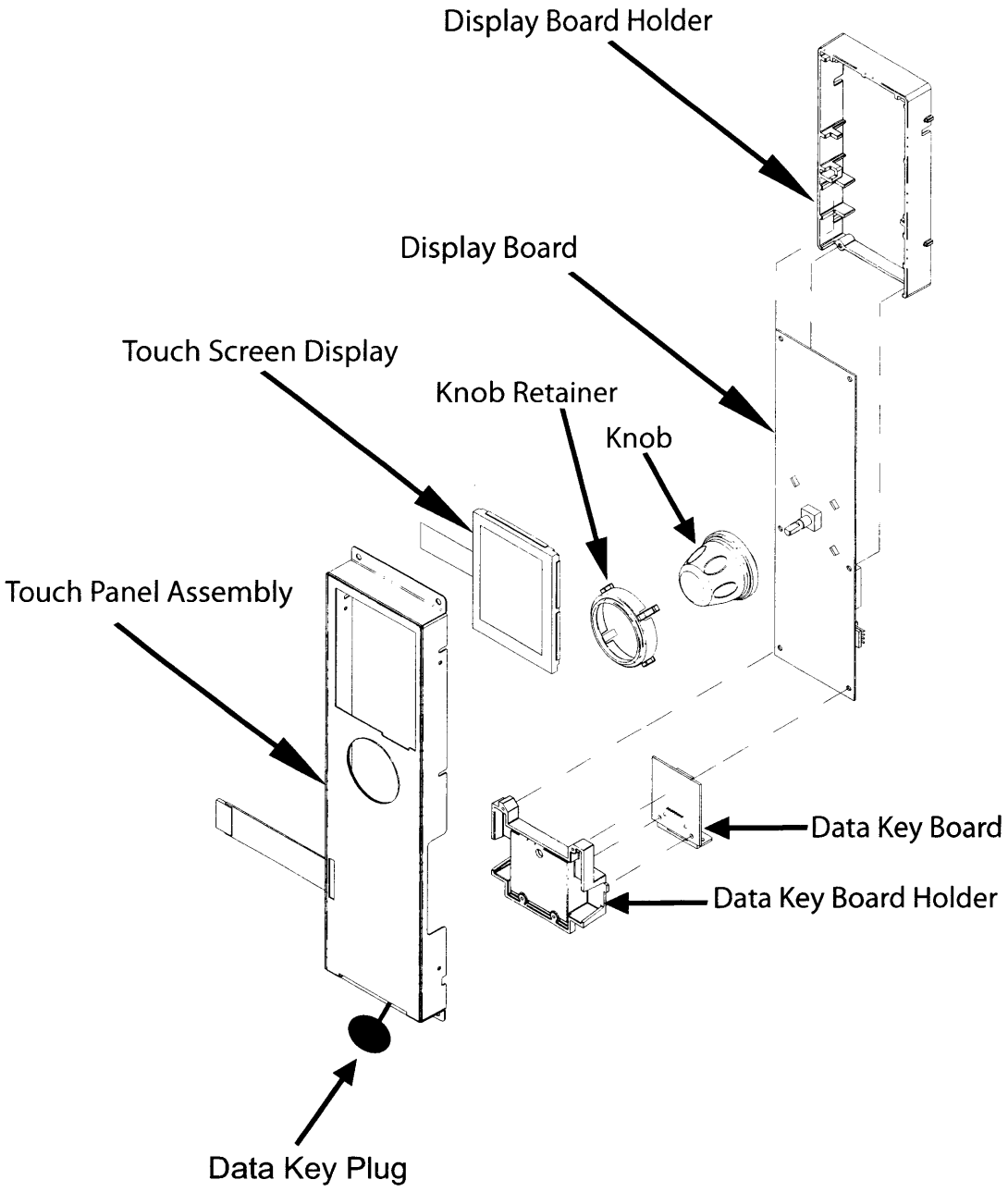


Rear (View)



Right Side (View)

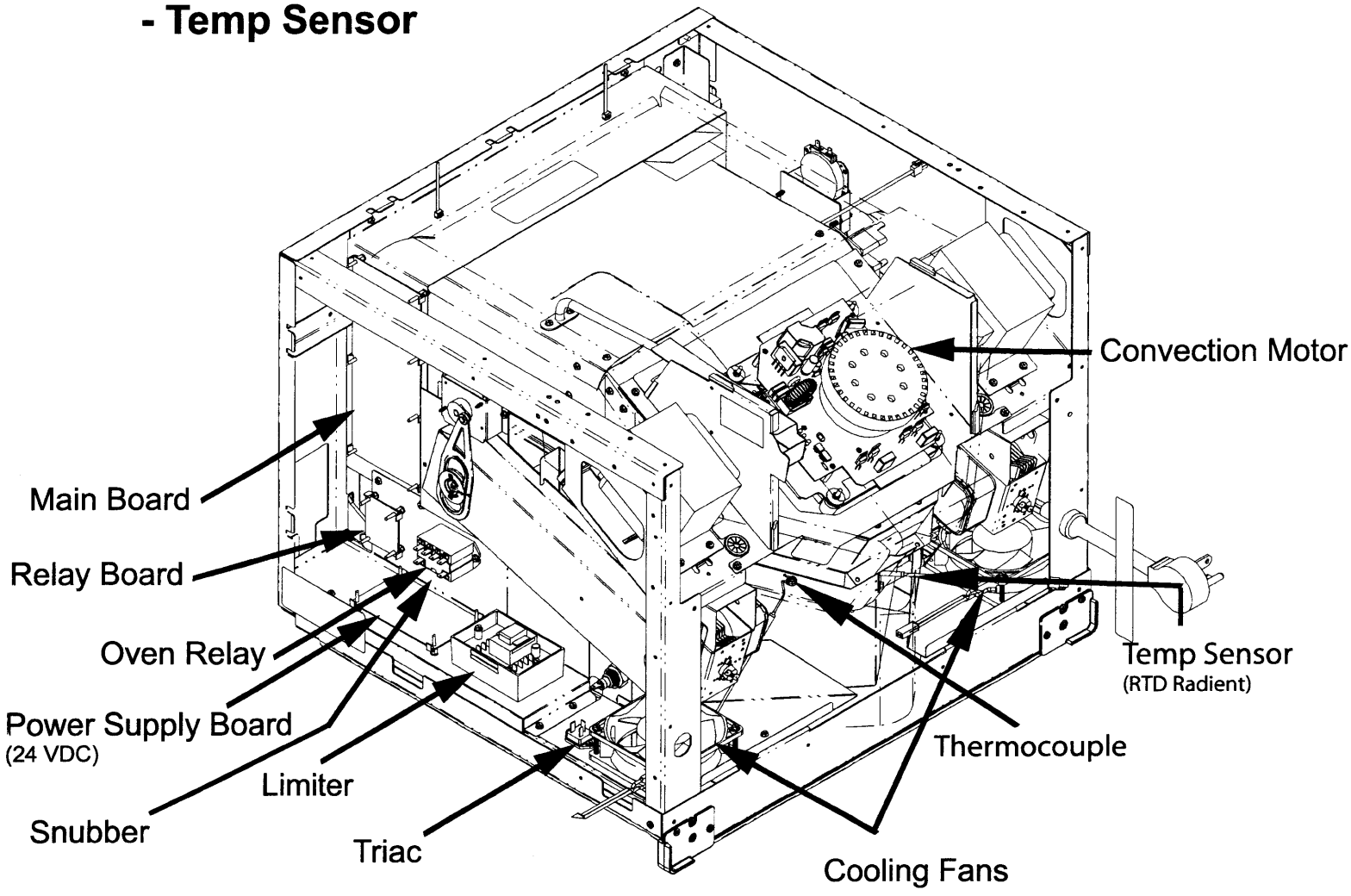
AXP 20
- Control Panel Assembly



Caution: Do not touch screen display by the sides. This may damage the display circuitry. Handle using the corners.

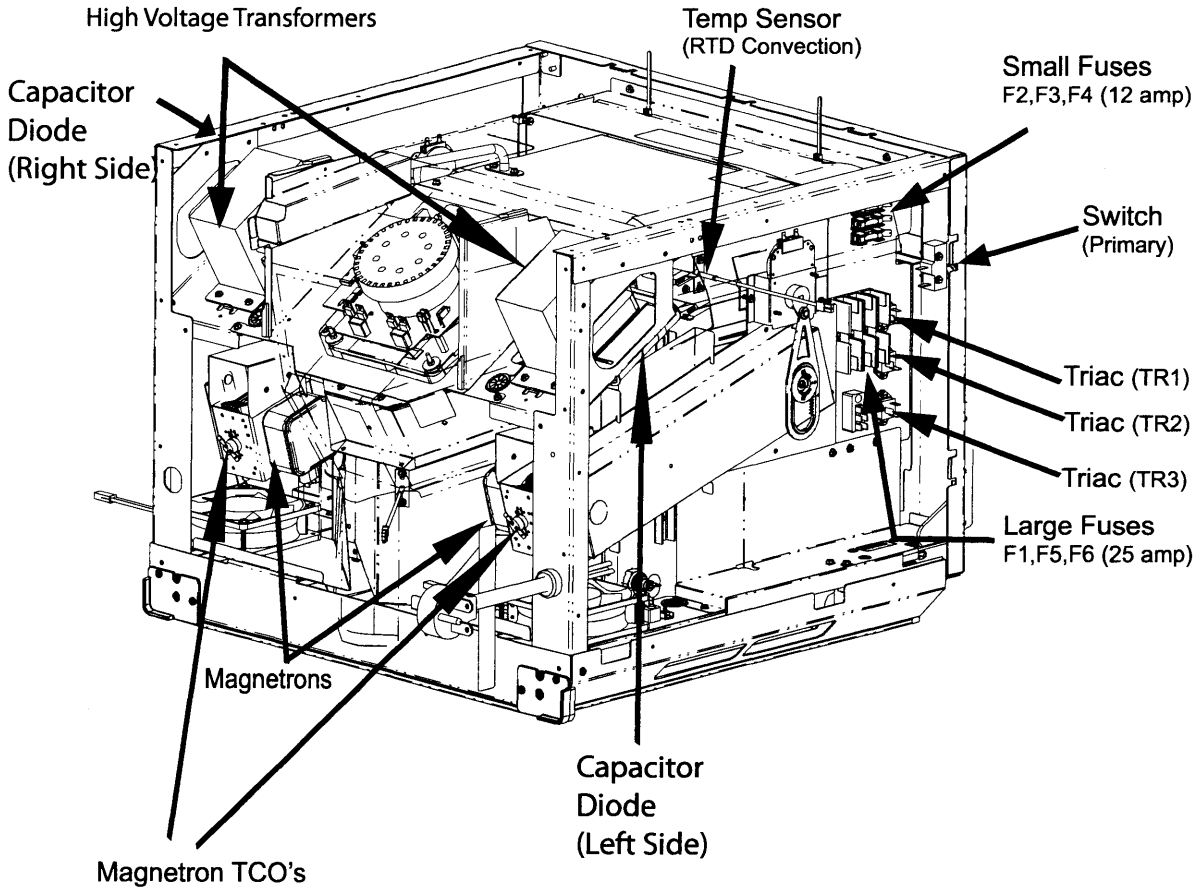
AXP 20

- Circuit Boards
- Oven Relay
- Limiter
- Triac
- Thermocouple
- Cooling Fans
- Convection Motor
- Temp Sensor



AXP 20

- **HV Transformers**
- **Magnetrons**
- **Fuses**
- **Sensor**
- **Triac's**
- **Magnetron TCO's**
- **Capacitor / Diodes**

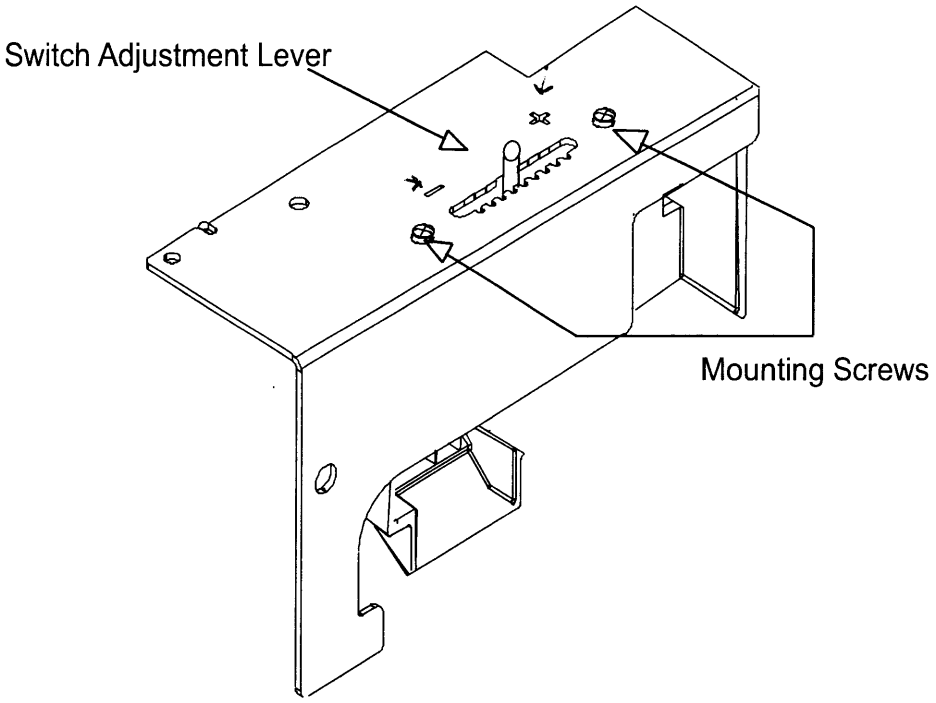


Legend

TR1 - Magnetron 1
TR2 - Magnetron 2
TR3 - Convection Heater
TR4 - Radiant Heater

F1 - Main Fuse
F2 - Convection Motor
F3 - Magnetron 1
F4 - Magnetron 2
F5 - Convection Heater
F6 - Radiant Heater

AXP 20
- Interlock Switch Adjustment



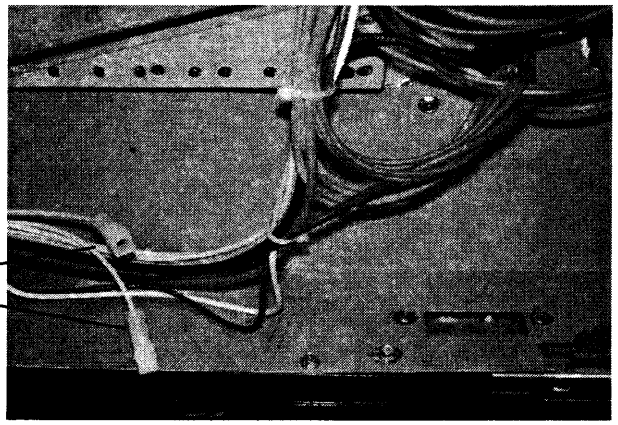


Figure 1

When the door is opened or closed, the left door hinge activates the secondary / monitor switches.

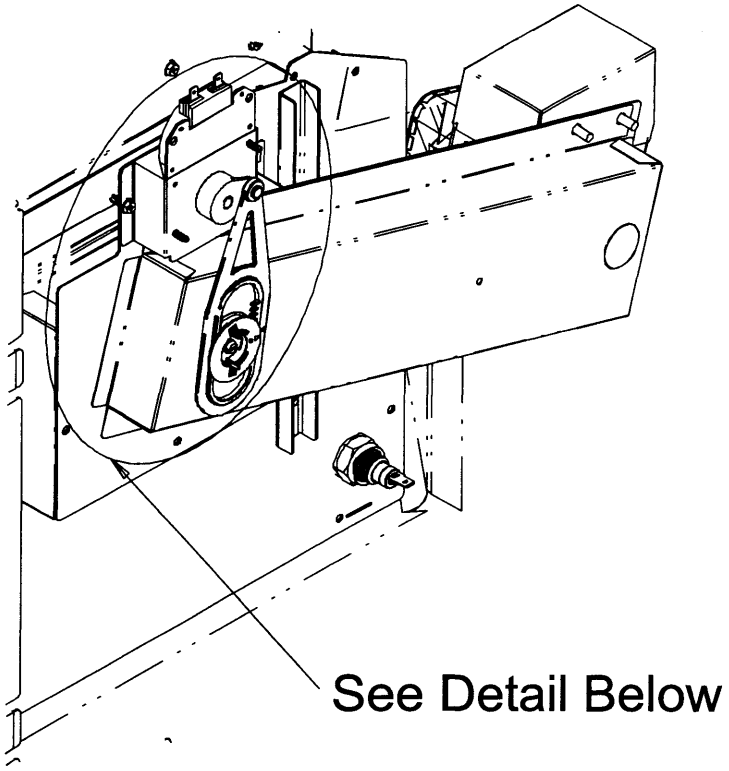
1. Remove air channel cover.
2. Connect an ohm-meter to wire harness *(as shown in Figure 1)*
3. Loosen mounting screws.
4. Slide adjustment lever for proper switch activation.

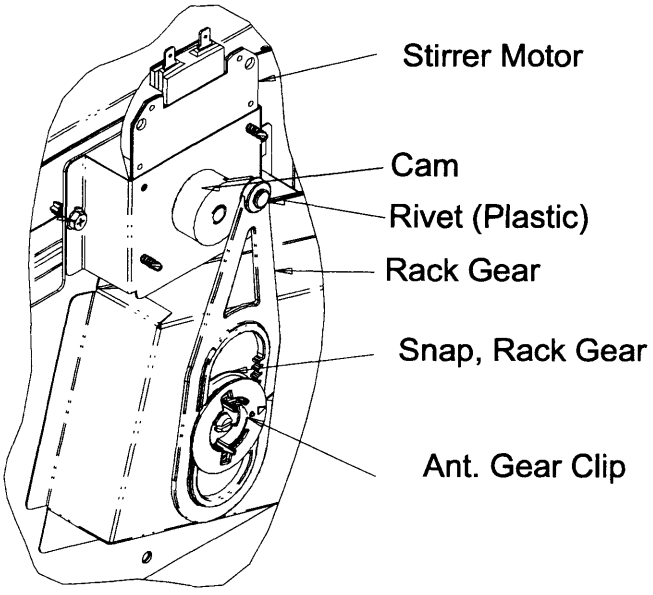
NOTE: To ensure proper switch adjustment, the switch mounting screws MUST be tightened after each adjustment prior to testing the door alignment.

NOTE: The switch assembly should activate when the door gap is approximately ¼ inch.

AXP 20

- Stirrer Motor
- Cam
- Rack Gear
- Snap, Rack Gear
- Ant. Gear Clip





AXP20

High Speed Commercial Combination Oven

Quick Start Reference Guide

Refer to Product Safety Manual for Safety Statements

Complete Owner's Manual available online

So...how do I use it?

The oven control can be used three ways

Touch Screen: Press the displayed pad to perform that operation

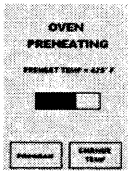
Keypad: Press numbers for preprogrammed menu items or to enter time or temperature

Dial: Rotate dial to move through items on the screen and press to select.

Cooking with Pre-programmed Pads

To cook food using pre-programmed menu items

1. Preheat Oven by pressing ON PREHEAT or rotate dial until ON PREHEAT is highlighted, Press knob to select.
2. Status bar shows oven preheating and temperature. When oven reaches temperature "READY" displays.



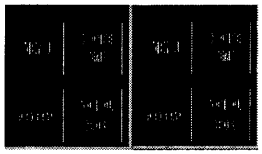
3. Press "MENU" or rotate knob until "MENU" is highlighted and press knob.
4. Rotate knob until menu item or menu group is highlighted or enter menu item number using keypad and press knob. (Repeat step if another menu group selection is displayed.)
   Open oven door, place food in oven and close door.
5. Cooking cycle begins.
6. At end of cooking cycle, oven beeps and and displays "DONE. REMOVE FOOD FROM OVEN"

Ready Screen

These are the options displayed after preheating the oven for High Speed Cooking.

MENU – Programmed menu items

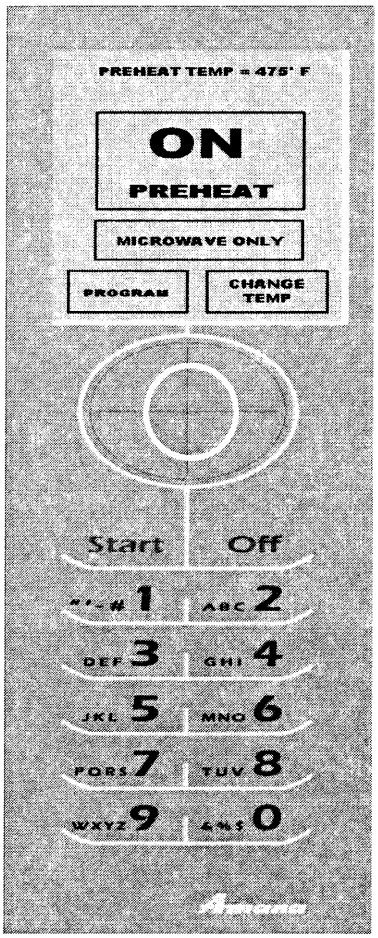
PROGRAM – Input items input to save to your menu



CHANGE TEMP – Change Preheat temp

MANUAL COOK – If allowed, enter manual cook cycles

When the oven is turned on for the first time, this is the display:



Programming or Changing Preheat Setting

This oven can be set to a preheat temperature between 210 °F and 500°F.

To program the preheat setting:

1. Oven must be plugged in.
2. Press CHANGE TEMP Pad

or

Rotate knob until CHANGE TEMP is highlighted and press knob to select.

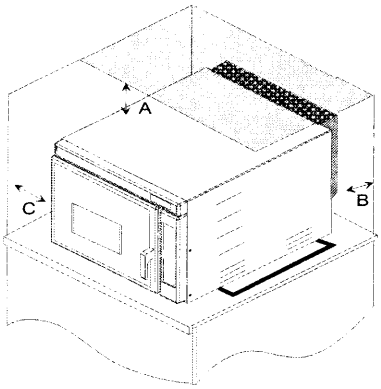
3 Enter desired temperature by using the numeric key pads.

or

Rotate knob until desired temperature is displayed and press knob to select.

4. Press SAVE.

Installation



Oven Clearances

A—For North American (UL/CSA) models, allow at least 2" (5.1 cm) of clearance around top of oven. For International (50 Hz) models, allow at least 12" (30 cm) of clearance around top of oven. Proper air flow around oven cools electrical components. With restricted air flow, oven may not operate properly and life of electrical parts is reduced.

B—Allow at least 2" (5.1 cm) between air discharge on back of oven and back wall.

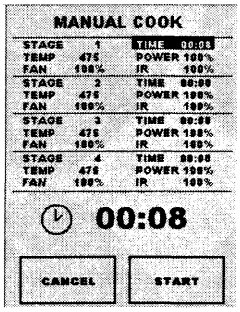
C—Allow at least 5" (12.7 cm) of clearance around sides of oven.

Quick Start Reference Guide

Refer to Product Safety Manual for Safety Statements

Using MANUAL COOK

To cook food using a specific entered time and power level.



Note:
To move to next function press dial only.

1. Select MANUAL COOK option on the READY screen.
2. For Stage 1, input desired cooking time using the key pad or rotate knob.Press knob to select.
3. Input desired temperature using the key pad or rotate knob. Press knob to select.
4. Rotate knob until desired microwave cooking power is displayed and press knob to select.
5. Rotate knob until desired cooking fan speed is displayed and press knob to select.
6. Rotate knob until desired heating setting is diplayed and press knob to select.
7. Repeat steps 2-6 for each cooking stage, if more than one stage is necessary.
8. Place food in oven as indicated on the oven display.
9. Press start pad or touch screen to start.
10. At end of cooking cycle, oven beeps and displays "DONE. REMOVE FOOD FROM OVEN".

Setting Up Programmed Menu Items

Select PROGRAM from the READY screen by rotating knob until PROGRAM is highlighted or by touching the pad on the screen and then pressing knob to select.

The AXP20 oven gives you flexible control to program the menu items. Programmed menu items can be entered in three levels. Each level allows you to enter the descriptions that will appear on the screen.

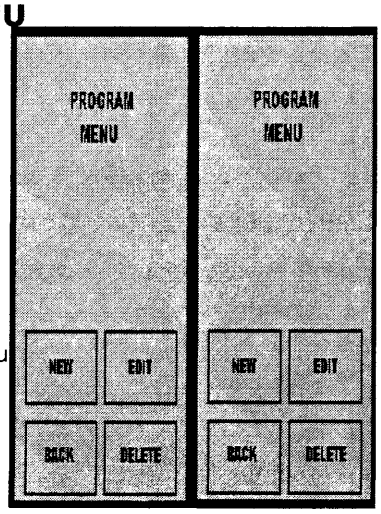
The Top Level might include up to six menu catagories (for example, Sandwiches,Entrees,Omlets, etc.) or it might be organized by quantity (1, 2, 3, 4, etc.) or in other ways that support your business.

The Mid-Level provides another opportunity to divide the options entered at the Top Level.

The Bottom Level can be programmed for up to nine menu items.

If you do not use all three levels, the unused levels will not be displayed on the screen. Set number of levels in User Options (MENU SETTINGS).

PROGRAM MENU



NEW – Add a new menu item

BACK – Go to previous screen

EDIT – Change an existing menu item

DELETE – Delete an existing menu item

Adding or Changing Top Level or Mid-Level Menu Item

1. From PROGRAM MENU rotate knob or touch screen to select NEW to add an item or EDIT or EDIT MENU to change an item (border will flash).

2. Press pad to program.

3. Enter name for menu using keypad digits for letters, numbers and symbols. **[For example: Press Keypad "2" three times for letter "c"]** When the correct letter is displayed, wait until cursor moves to the next space. If a correction is necessary, press CLEAR to erase one character at a time.

4. Press SAVE when item is complete.

5. Press EXIT MENU to return to READY display.

Keypad	Character
1	",', -, #, 1
2	a, b, c, A, B, C, 2
3	d, e, f, D, E, F, 3
4	g, h, i, G, H, I, 4
5	j, k, l, J, K, L, 5
6	m, n, o, M, N, O, 6
7	p, q, r, s, P, Q, R, S, 7
8	t, u, v, T, U, V, 8
9	w, x, y, z, W, X, Y, Z, 9
0	&, %, $, 0

Quick Start Reference Guide

Refer to Product Safety Manual for Safety Statements

Adding Bottom Level Menu Item

Select NEW from the PROGRAM MENU. Select desired Top and Mid-Level menus. At Bottom Level Menu touch CREATE or rotate knob to CREATE and press knob. Rotate knob until unused menu item is highlighted or until item to be changed is highlighted and press knob.

Select Menu Item from display by touching the screen or rotating the knob to highlight the item and then pressing to select.

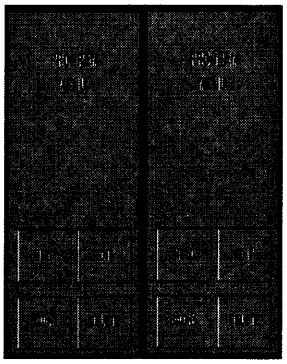
1. For Stage 1 rotate the knob until the desired time is displayed or enter the time using the keypad numbers and then press the knob.
2. The display will advance to the temperature. Rotate the knob until the desired temperature is displayed or enter the temperature using the keypad and then press the knob.
3. Continue to enter the microwave cooking power. Keys 0 t0 9 will enter a power level of 0% to 90%. Press knob.
4. Rotate the knob until the desired cooking fan speed is displayed or use keypad to enter desired speed. Keys 0 to 9 will enter a speed of 0% to 90%. Press knob.
5. Rotate knob until desired cook heater level is displayed or used keypad to enter desired level. Keys 0 to 9 will enter cook heaters levels 0% to 90%. Press knob.
6. Touch SAVE

If necessary, repeat steps 1 through 5 for stages 2, 3, and 4.

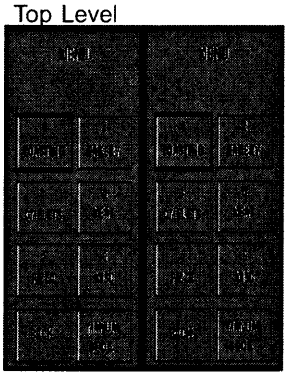
Touch CREATE or press knob to CONFIRM OVERWRITE.

Enter Item Names using letters on keypad and touch SAVE.

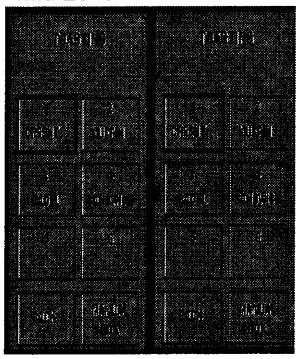
Menu Examples



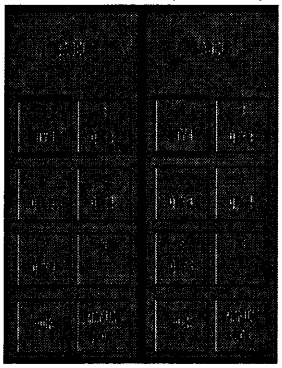
Top Level



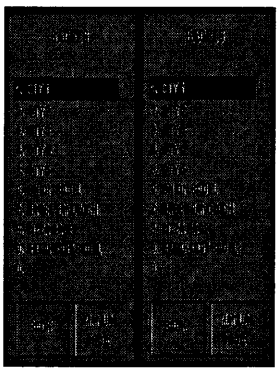
Mid Level



Bottom Level (Buttons)



Bottom Level (Numeric)



MICROWAVE ONLY

This option is only available if the oven cavity temperature is less than 200°F.

If this option is available, it displays at the ON PREHEAT menu.

To cook a pre-programmed microwave only item follow these steps:

1. Select MICROWAVE ONLY by touching the option on the screen or rotate the knob until the option is highlighted and then press knob.
2. Select desired item by rotating knob until the item is highlighted or by entering the item number using the keypad and press knob.
3. Place food in oven.
4. Oven will beep when food is ready.

Adding MICROWAVE ONLY menu item

Select PROGRAM at the ON PREHEAT display.

1. Select NEW from the PROGRAM MENU.
2. For Stage 1, input desired cooking time using the key pad or rotate knob.Press knob to select.
3. Input desired time using the key pad or rotate knob to display desired time. Press knob to select.
4. Rotate knob until desired microwave cooking power is displayed or use kyepad to enter desired power level. Keys 0 to 9 will enter a power level of 0% to 90%. Press knob to select.
5. Repeat steps 2-5 for each cooking stage, if more than one stage is necessary.
6. Press SAVE.
7. Using letters on keypad, enter Item Name and touch SAVE.

Quick Start Reference Guide

Refer to Product Safety Manual for Safety Statements

Changing User Options

There are several option you can change to customize the operation of the oven for your business. The table below shows these options; the factory setting is shown in bold type.

1. Oven must be in Standby Mode.
2. Press and hold "2" keypad for three seconds.
3. Choose option by turning knob to highlight desired option. Press knob and the next option will be highlighted. Or move to the next option by pressing NEXT OPTION. Scroll backwards through the option by pressing PREVIOUS OPTION pad.
4. Press SAVE when finished.

Setting	Options
Double Digit Entry	**Single Digit Entry**
	Double Digit Entry
Menu Setting	1 Level
	2 Levels
	3 Levels
Manual Lock	**Manual Cooking allowed**
	Manual Cooking not allowed
Program Lock	**Changes to Programs allowed**
	Password needed
Door Open	Opening Door resets timer
	Opening Door Pauses cook cycle
Keybeep	Off
	On
Keybeep Volume	Low
	Medium
	High
End of Cycle Beep	Continuous until door is opened
	Three beeps once
	Three beeps repeating
Keyboard Window	Off
	30 seconds
	60 seconds
	120 seconds
Preheat Warnings	Off
	Warn if oven not at temperature
Temperature Scale	**Degrees F**
	Degrees C
Clean Filter	Off
	Displays every 7 days
	Displays every 30 days
	Displays every 90 days
Auto Menu	From preheat, go to Ready
	From preheat, go to Menu
Magnetron Control	**No Individual Tube Programming**
	Individual Tube Programming
Data Transfer	**Begin transfer from Card to Oven**
	Begin transfer from Oven to Card
Microwave Only Mode	**No Microwave Only Mode**
	Allow Microwave Only Mode
Manual Program Save	Do not save after Manual Cook
	Save after Manual Cook
No Load Detect Warning	**Disable**
	Enable

CLEAN FILTER

When this message displays, Amana Commercial Products recommends cleaning the air filter thoroughly. **Cleaning the air filter will not shut off the message.** The message will automatically stop displaying after 24 hours.

Depending on microwave use and environmental conditions, the filter may need to be cleaned more or less frequently. Once the frequency is determined, set the option for the appropriate time frame.

Air filter and vents must be cleaned regularly to prevent overheating of the oven. Refer to Owner's Manual for complete cleaning instructions.

AXP20 Error Codes

Errors are listed in the form of XY, where X is the type of error and Y is the parameters or details or the error.

Fatal Errors

Error Type	Parameters/Description
A – Control	0 – Invalid program checksum
B – Keypad	0 – Partially shorted keypad 1 – Fully shorted keypad
C – Cavity RTD	0 – Open 1 – Shorted 2 – Out of Range
D – Heater RTD	0 – Open 1 – Shorted 2 – Out of Range
E – Mag #1 T/C	0 – Open 1 – Shorted 2 – Out of Range
F – Mag #2 T/C	0 – Open 1 – Shorted 2 – Out of Range
G – Overheaded	0 – Cavity too hot 1 – Heaters too hot 2 – Magnetrons too hot

Non-Fatal Errors

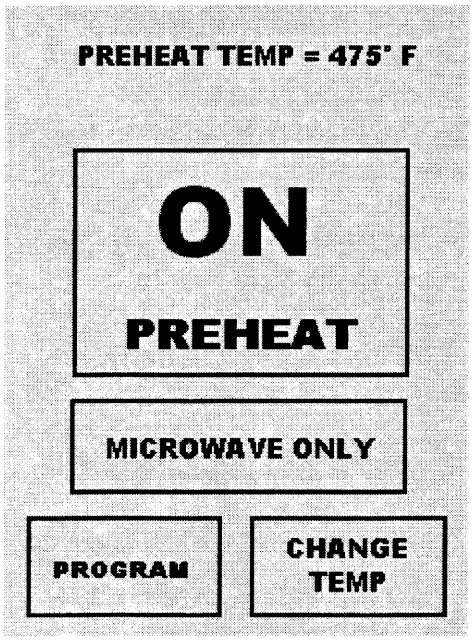
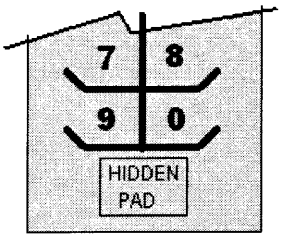
Error Type	Parameters/Description
M – Current Sensor	0 – Insufficient amperage

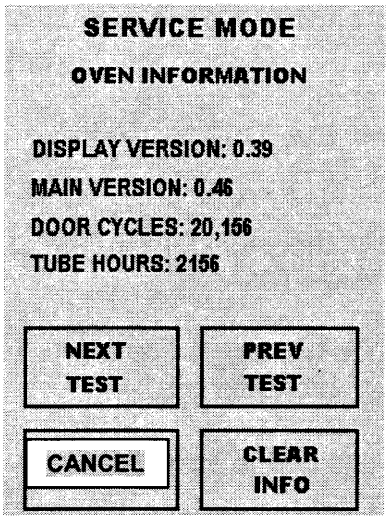
Data Transfer Errors

These errors occur during the use of the data transfer card. If an error occurs, the data transfer will be cancelled, and the error message shall be shown until STOP/RESET is pressed.

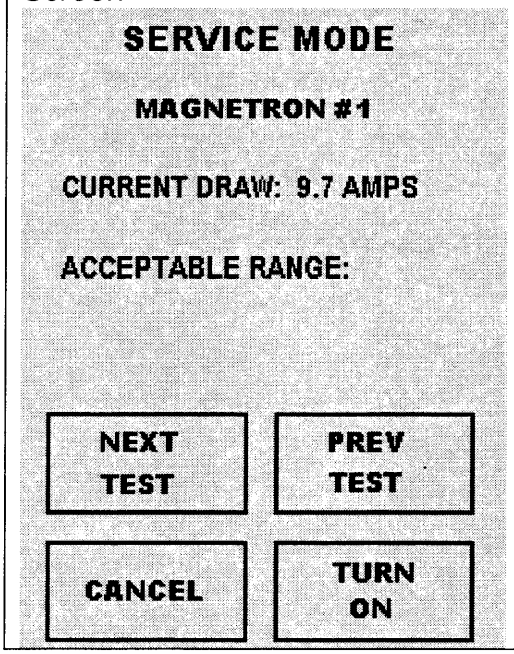
Error Type	Parameters/Description
S – Double Digit	0 – Double Digit Called for, but not set
T – Memory full	0 – The menu memory space is full
U – Memory switch	0 – The memory switch setting is invalid

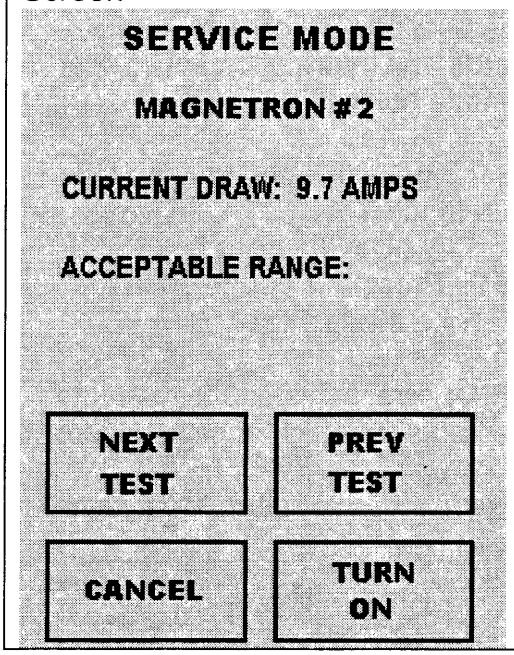
Cheetah Service Mode

Access to Service Mode	
Screen 	While at the Main Screen, press the following sequence on the keypad: Hidden Pad – 1 – 3 – 5 – 7 – 9 The oven will go into Service Mode. Location of Hidden Pad: 

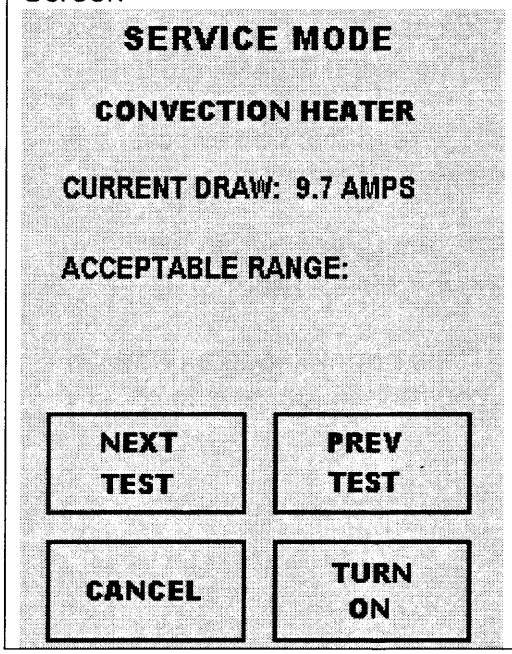
Oven Information	
Screen 	The first screen will be Oven Information showing the versions of software in the control boards and information about door cycles and tube hours. **NEXT TEST:** Press this pad to go to the next Service Mode Test **PREV TEST:** Press this pad to go to the previous Service Mode Test **CLEAR INFO:** Press this pad to reset the Door Cycles and Tube Hours back to zero. **EXIT:** Press this pad to return to the ovens Main Menu

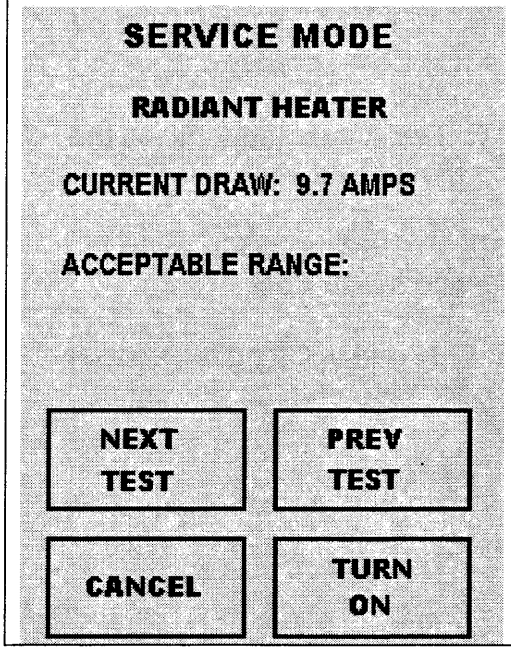
Cheetah Service Mode

Manual Operation of Magnetron #1	
Screen  	The next screen will allow operation of Magnetron #1 and show the number of amps being drawn. **NEXT TEST:** Press this pad to go to the next Service Mode Test **PREV TEST:** Press this pad to go to the previous Service Mode Test **TURN ON:** This pad will toggle between turning the magnetron on and off. **CANCEL:** Press this pad to return to the Main Menu

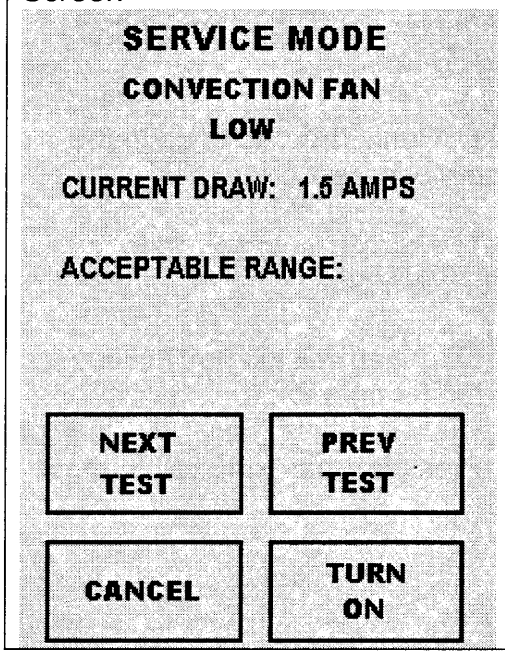
Manual Operation of Magnetron #2	
Screen  	The next screen will allow operation of Magnetron #1 and show the number of amps being drawn. **NEXT TEST:** Press this pad to go to the next Service Mode Test **PREV TEST:** Press this pad to go to the previous Service Mode Test **TURN ON:** This pad will toggle between turning the magnetron on and off. **CANCEL:** Press this pad to return to the Main Menu

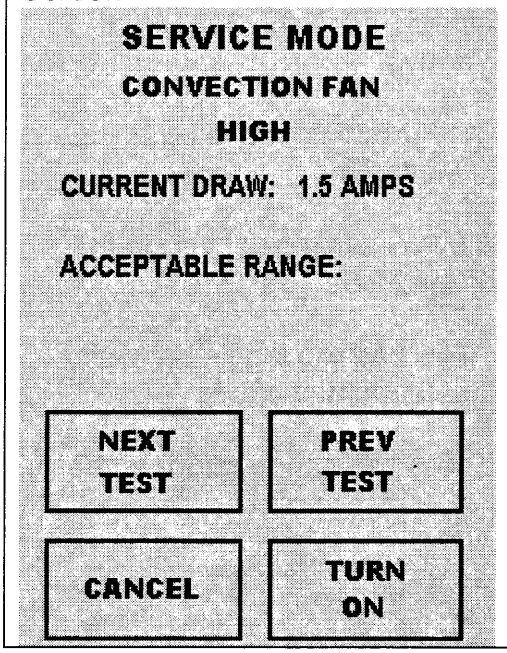
Cheetah Service Mode

Convection Heater	
Screen  	The next screen will allow operation of the convection heater and show the number of amps being drawn. **NEXT TEST:** Press this pad to go to the next Service Mode Test **PREV TEST:** Press this pad to go to the previous Service Mode Test **TURN ON:** This pad will toggle between turning the heater on and off. **CANCEL:** Press this pad to return to the Main Menu

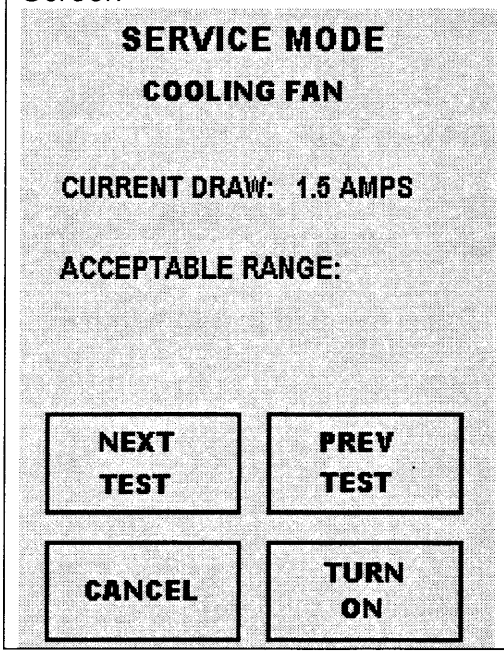
Radiant Heater	
Screen  	The next screen will allow operation of the radiant heater and show the number of amps being drawn. **NEXT TEST:** Press this pad to go to the next Service Mode Test **PREV TEST:** Press this pad to go to the previous Service Mode Test **TURN ON:** This pad will toggle between turning the heater on and off. **CANCEL:** Press this pad to return to the Main Menu

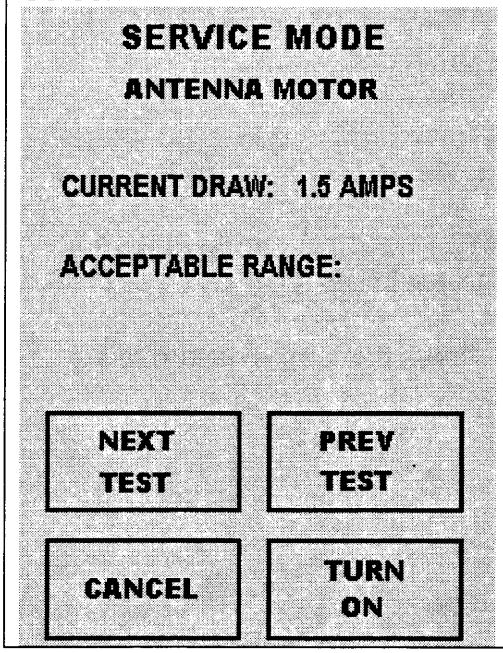
Cheetah Service Mode

Convection Fan – Low Speed	
Screen  	The next screen will allow operation of the convection fan at a low speed and show the number of amps being drawn. **NEXT TEST:** Press this pad to go to the next Service Mode Test **PREV TEST:** Press this pad to go to the previous Service Mode Test **TURN ON:** This pad will toggle between turning the convection fan on and off at a low speed. **CANCEL:** Press this pad to return to the Main Menu

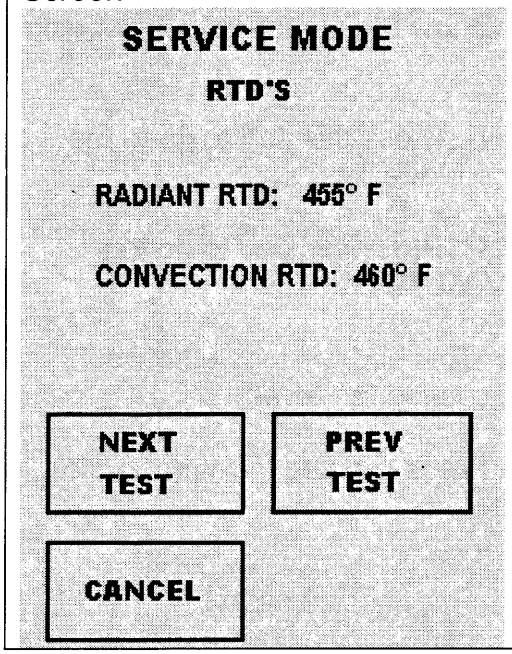
Convection Fan – High Speed	
Screen  	The next screen will allow operation of the convection fan at a high speed and show the number of amps being drawn. **NEXT TEST:** Press this pad to go to the next Service Mode Test **PREV TEST:** Press this pad to go to the previous Service Mode Test **TURN ON:** This pad will toggle between turning the convection fan on and off at a high speed. **CANCEL:** Press this pad to return to the Main Menu

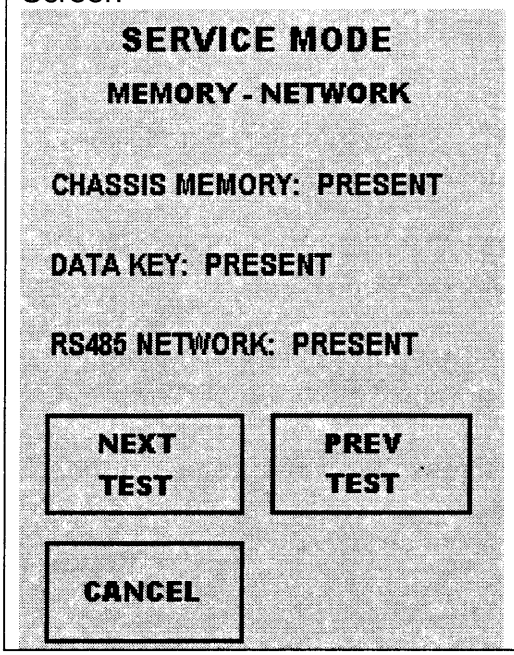
Cheetah Service Mode

Cooling Fan	
Screen 	The next screen will allow operation of the cooling fan show the number of amps being drawn. **NEXT TEST:** Press this pad to go to the next Service Mode Test **PREV TEST:** Press this pad to go to the previous Service Mode Test **TURN ON:** This pad will toggle between turning the cooling fan on and off. **CANCEL:** Press this pad to return to the Main Menu

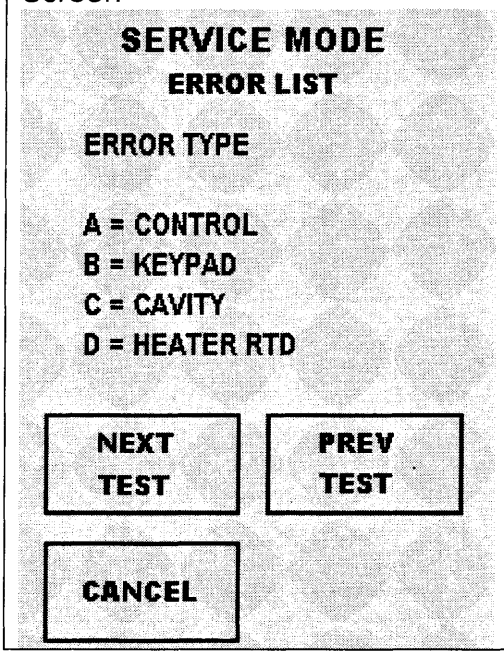
Antenna Motor	
Screen 	The next screen will allow operation of the antenna motor show the number of amps being drawn. **NEXT TEST:** Press this pad to go to the next Service Mode Test **PREV TEST:** Press this pad to go to the previous Service Mode Test **TURN ON:** This pad will toggle between turning the antenna motor on and off. **CANCEL:** Press this pad to return to the Main Menu

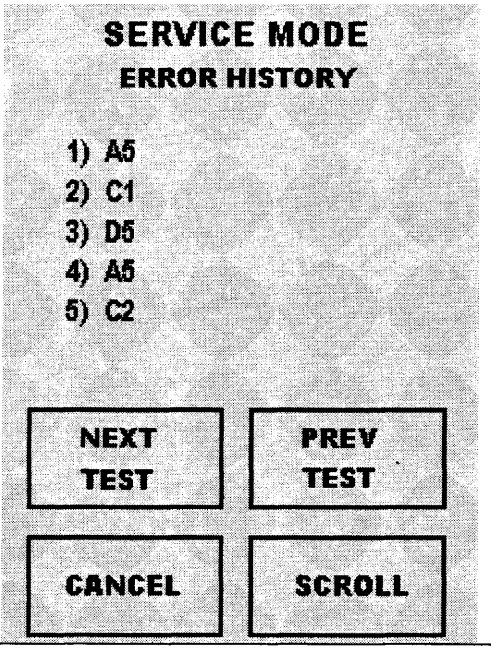
Cheetah Service Mode

RTD Status	
Screen 	The next screen will show the temperatures being reported to the RTD's in the oven.. **NEXT TEST:** Press this pad to go to the next Service Mode Test **PREV TEST:** Press this pad to go to the previous Service Mode Test **CANCEL:** Press this pad to return to the Main Menu

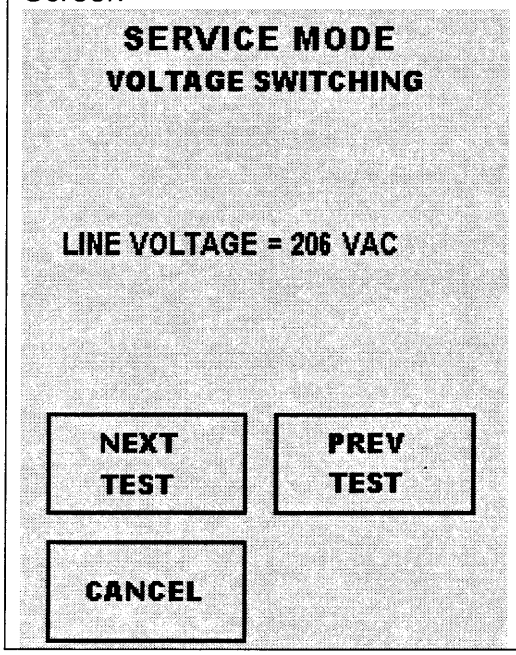
Memory / Network Status	
Screen 	The next screen will show which memory chips are present and if the oven is hooked up to an external network.. **NEXT TEST:** Press this pad to go to the next Service Mode Test **PREV TEST:** Press this pad to go to the previous Service Mode Test **CANCEL:** Press this pad to return to the Main Menu

Cheetah Service Mode

Error List	
Screen 	The next screen will show a description of the types of errors that can occur. **NEXT TEST:** Press this pad to go to the next Service Mode Test **PREV TEST:** Press this pad to go to the previous Service Mode Test **CANCEL:** Press this pad to return to the Main Menu

Error History	
Screen 	The next screen will the previous error codes that have occurred in the oven. **NEXT TEST:** Press this pad to go to the next Service Mode Test **PREV TEST:** Press this pad to go to the previous Service Mode Test **SCROLL:** This pad will advance through the history of the error codes. **CANCEL:** Press this pad to return to the Main Menu

Cheetah Service Mode

Voltage Switching	
Screen  	The next screen will the line voltage detected by the oven. **NEXT TEST:** Press this pad to go to the next Service Mode Test **PREV TEST:** Press this pad to go to the previous Service Mode Test **CANCEL:** Press this pad to return to the Main Menu

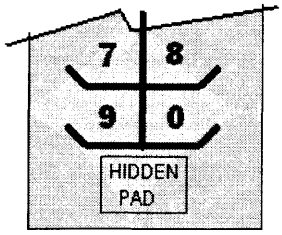
AXP20 Component Calibration

59002120 (Display- Touch Screen)

59002116 (Display Board)

When replacing The **Display Board** or the **Display Touch Screen** You Must recalibrate the oven.

1. The oven must be plugged In.
2. Stand-by screen must be in the Display.
3. Press the **Hidden Pad.**

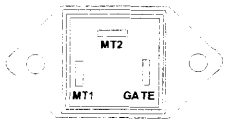
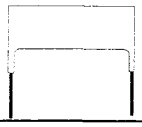
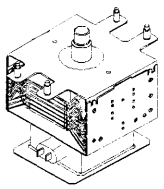
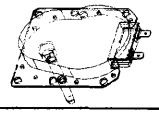


4. Press Pads 4, 5, 6.
5. While pressing Directly ON small Square in the Display press and release Pad 1.
   - The Square will move to a different location on the Display
6. While Pressing Directly ON the small Square in the Display press and release Pad 2. – The Square will move to a different Location on the Display
7. While pressing Directly On the small Square in the Display
8. Press and release Pad 3.
9. The screen should be blank
10. Press the 0 Pad.
11. A Test Screen will be shown, anywhere you press on the screen a small box will appear.
12. Press the 0 pad to return to the Stand-by screen.

Component Testing Procedures

⚠ WARNING

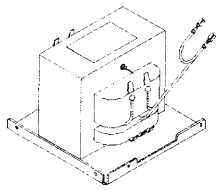
To avoid risk of electrical shock, personal injury or death; disconnect power to oven and discharge capacitor before servicing, unless testing requires power.

Illustration	Component	Test	Results
	Thermal cutout	Disconnect all wires from TCO. Measure resistance across terminals. Control TCO ..... Magnetron TCO	 Closed at 235°F (113°C) and open at 150°F (66°C) Open at 300°F (149°C) and closed at 257°F (125°C)
	Diode	**Discharge Capacitor** Remove diode lead from capacitor and connect ohmmeter. Reverse leads for second test.	Infinite resistance should be measured in one direction and 50KΩ or more in the opposite direction. **NOTE:** Ohmmeter must contain a battery of 6 volts minimum.
	Triac	Disconnect wires to triac. Measure resistance from: MT1 to MT2..... MT1 to Gate ..... MT2 to Gate ..... All terminals to ground	**Caution - Do not operate oven with wire to terminal MT2 removed.** Infinite Approximately 15 Ω, then reverse meter leads 30 Ω Infinite Infinite
Triac 1 (top) is for front element Triac 2 (middle) is for rear element		Measure voltage from: MT1 to Gate	0.8 VAC when energized. If no voltage, check H.V. board and wiring.
	Capacitor	**Discharge Capacitor** Remove wires from capacitor terminals and connect ohmmeter, set on highest resistance scale to terminals. Also check between each terminal and capacitor case.....	 Between Terminals: Meter should momentarily deflect towards zero then return to over 5 MΩ. If no deflection occurs, or if continuous deflection occurs, replace capacitor. Terminal to Case: Infinite resistance
	Snubber assembly	Disconnect wires to snubber. Measure resistance across terminals.....	 Infinite
	Magnetron	**Discharge Capacitor** Remove wires from magnetron and connect ohmmeter to terminals. Also check between each terminal and ground.	Between Terminals: Less than 1 Ω Each terminal to ground measures Infinite resistance. **Note:** This test is not conclusive. If oven does not heat and all other components test good replace the magnetron and retest.
	Cooling blower motor	Remove all wires from motor. Measure resistance across coil	 Approximately Ω
	Stirrer motor	Remove all wires from terminals. Measure resistance from: Terminal to terminal.....	 Approximately 29K Ω

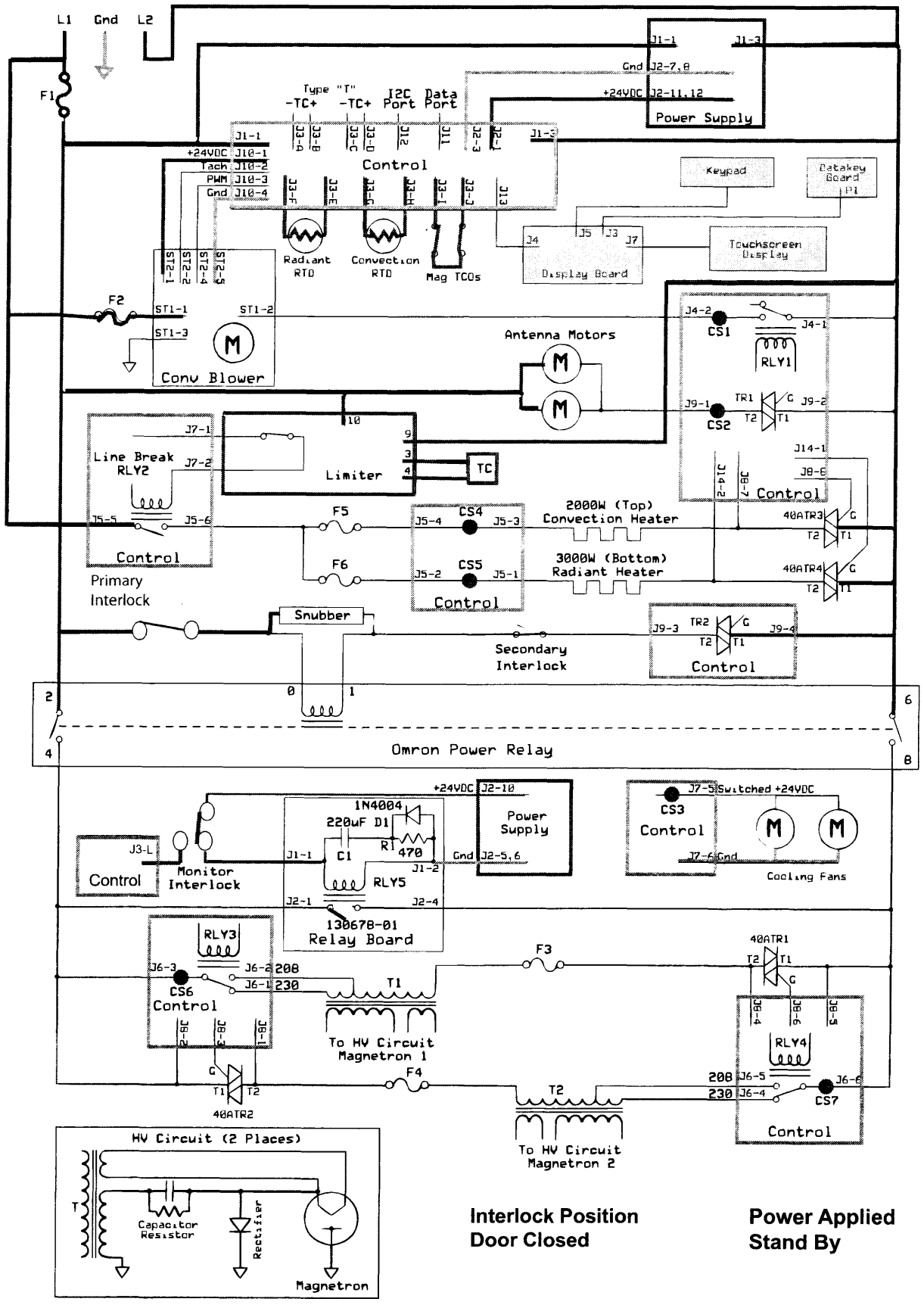
Component Testing Procedures

⚠ WARNING

To avoid risk of electrical shock, personal injury or death; disconnect power to oven and discharge capacitor before servicing, unless testing requires power.

Illustration	Component	Test	Results
	Transformer	**Discharge Capacitor** Remove all wires from terminals. Measure resistance from: 230 to COM..... 208 to COM..... 230 to Ground..... 208 to Ground..... Terminal 5 to 6..... Terminal 4 to Ground.....	 Less than 1 Ω Less than 1 Ω Infinite Infinite Less than 1 Ω Approximately Ω
	Convection blower motor	Remove wires from motor. Measure resistance across Terminals.....	 Approximately Ω
	Convection heating element	Disconnect wires from terminals. Measure resistance across heating element. Element 2100 W.....	 Approximately Ω
	Cavity heating element	Disconnect wires from terminals. Measure resistance across heating element. Element 900 W.....	 Approximately Ω
	Resistance thermal device (RTD)	Temperature 32°F..... 350°F.....	Resistance 1000 Ω 1654 Ω
	Lamp receptacle	Test continuity of receptacle terminals.....	Indicates continuity with bulb screwed in.

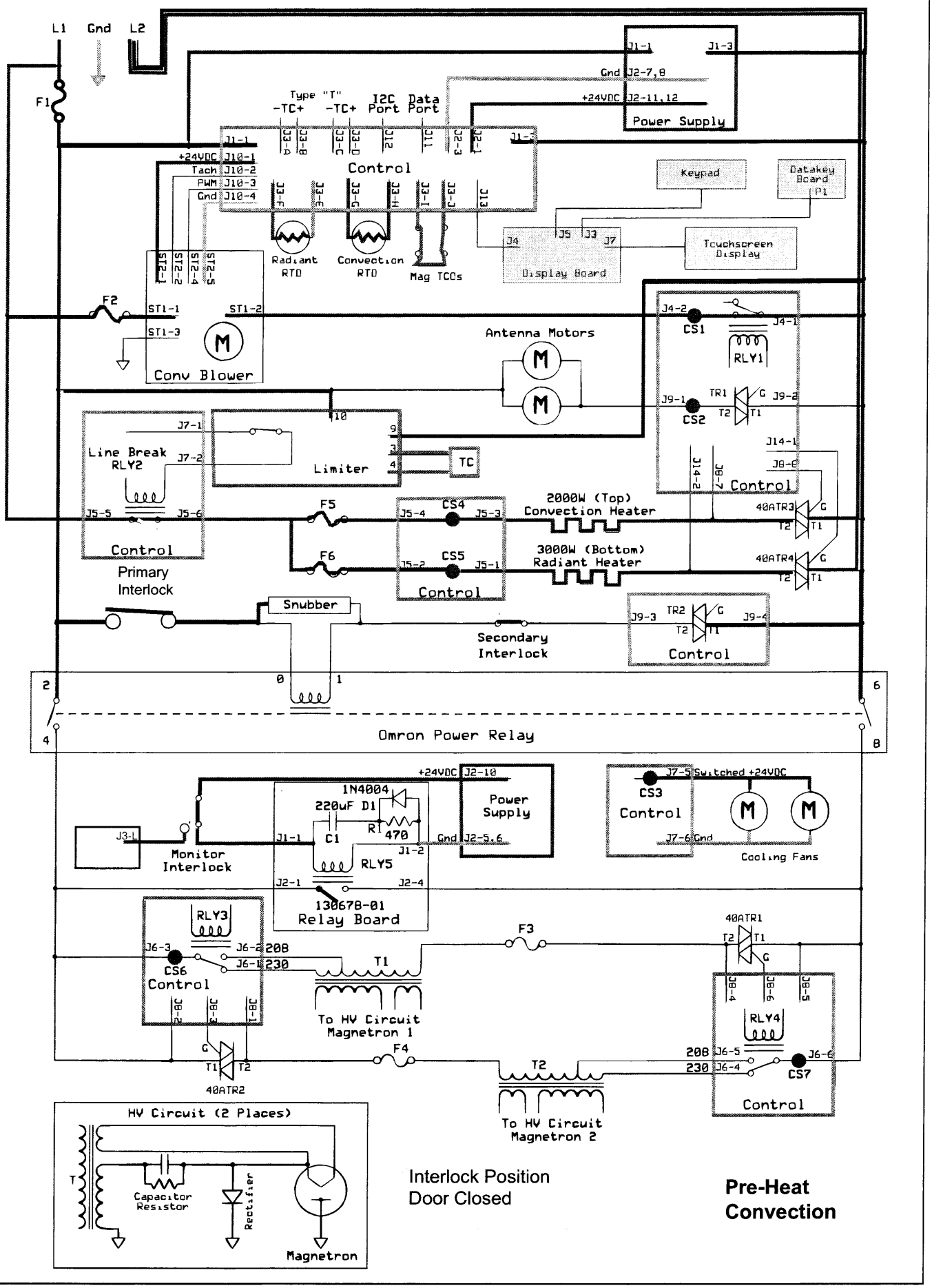
AXP 20 (Current Production)
P1333601M



Interlock Position
Door Closed

Power Applied
Stand By

AXP 20 (Current Production)
P1333601M

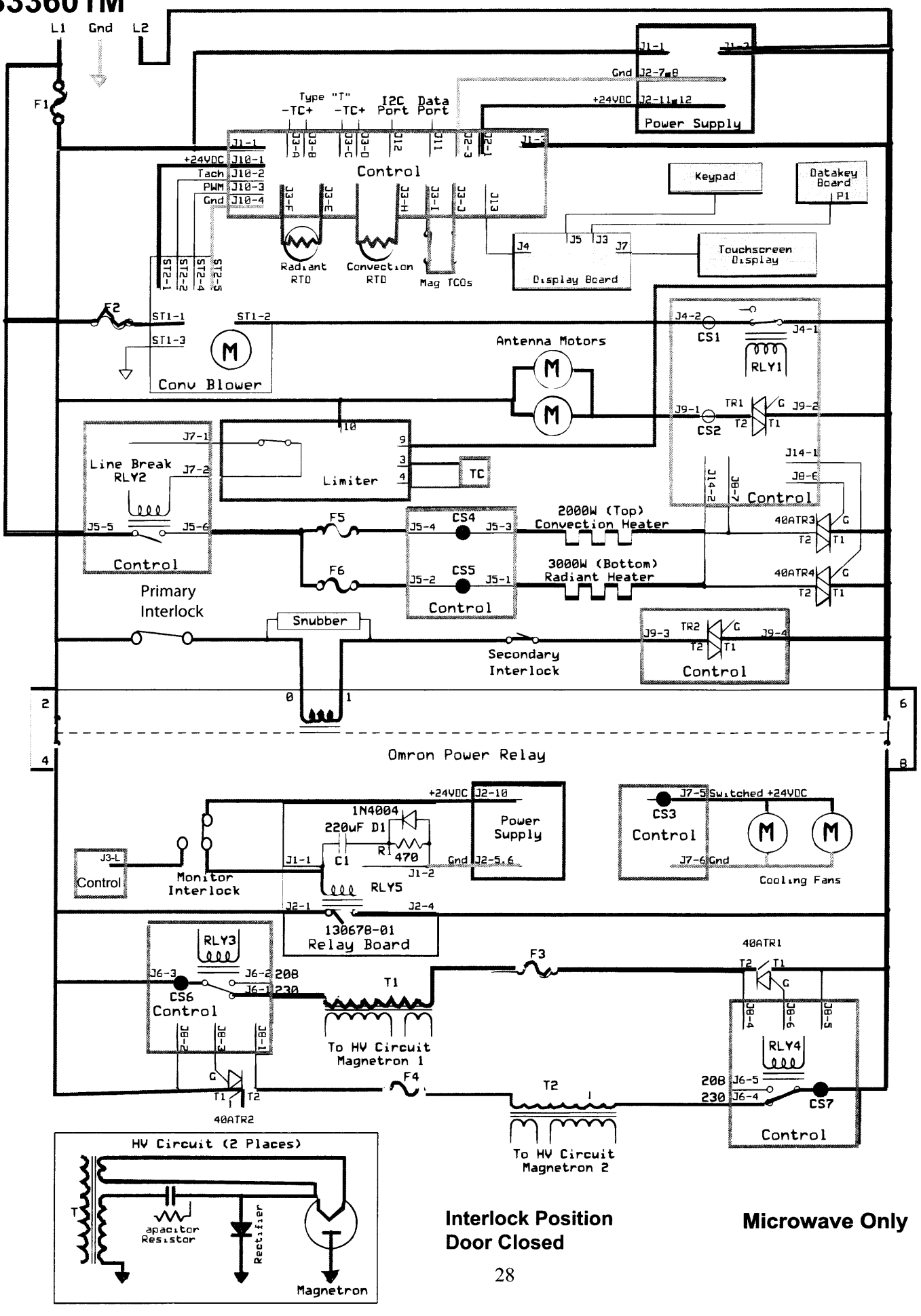


Interlock Position
Door Closed

Pre-Heat
Convection

AXP 20 (Current Production)

P1333601M



Interlock Position
Door Closed

Microwave Only